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NINE MILE POINT
NUCLEAR STATION

October 10, 2011

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

Licensee Event Report 2011-003, Reactor Shutdown Due to an Unisolatable Leak on a Feedwater Pump Minimum Flow Line

In accordance with 10 CFR 50.73(a)(2)(iv)(A), please find attached Licensee Event Report 2011-003, Reactor Shutdown Due to an Unisolatable Leak on a Feedwater Pump Minimum Flow Line.

There are no regulatory commitments in this submittal.

Should you have questions regarding the information in this submittal, please contact John J. Dosa, Director Licensing, at (315) 349-5219.

Very truly yours,

MDF/RJC

Attachment: Licensee Event Report 2011-003, Reactor Shutdown Due to an Unisolatable Leak on a Feedwater Pump Minimum Flow Line

cc:

NRC Project Manager
NRC Resident Inspector
NRC Regional Administrator

ATTACHMENT

LICENSEE EVENT REPORT 2011-003

**REACTOR SHUTDOWN DUE TO AN UNISOLATABLE LEAK
ON A FEEDWATER PUMP MINIMUM FLOW LINE**

LICENSEE EVENT REPORT (LER)
(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Nine Mile Point Unit 2

2. DOCKET NUMBER

05000410

3. PAGE

1 of 5

4. TITLE

Reactor Shutdown Due to an Unisolatable Leak on a Feedwater Pump Minimum Flow Line

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	11	2011	2011	003	00	10	10	2011	None	NA
									None	NA

9. OPERATING MODE

1

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D) | |
- Specify in Abstract below or in NRC Form 366A

10. POWER LEVEL

15

12. LICENSEE CONTACT FOR THIS LER

NAME

John J. Dosa, Director Licensing

TELEPHONE NUMBER (Include Area Code)

(315) 349-5219

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SJ	N/A	N/A	Y					

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR
NA	NA	NA

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 10, 2011 at 2200, during power ascension from an outage with the reactor operating at approximately 15% of rated thermal power, a leak was identified on a vent pipe connected to the minimum flow line for the "A" feedwater pump. At 0016 on August 11, the reactor was manually shut down due to the unisolatable leak on the feedwater pump minimum flow line.

The leak was the result of a failed weld on the feedwater minimum flow line vent pipe due to vibration induced fatigue failure. The vibration increased due to two recent design modifications that affected the "A" feedwater pump minimum flow line. The potential for these design changes to increase vibration and adversely impact system operation had been identified, but was not anticipated to result in a failure of this type. Although the minimum flow piping had been evaluated and was being monitored, the small bore vent line had not been equally modeled or evaluated.

The vent pipe was rewelded to the minimum flow line using an improved 2:1 weld profile and a pipe-to-pipe support was installed to make the pipe more robust and less susceptible to vibration.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Nine Mile Point Unit 2	05000410	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 5
		2011	003	00	

NARRATIVE

I. DESCRIPTION OF EVENT

A. PRE-EVENT PLANT CONDITIONS:

Prior to this event, Nine Mile Point Unit 2 (NMP2) was operating in Mode 1 at approximately 15 percent power with no inoperable systems affecting this event.

B. EVENT:

On August 10, 2011 at 2200, water was found coming from a vent pipe on the minimum flow line for the "A" feedwater pump. The circumferential pipe crack was in the heat affected zone of the pipe to sock-o-let weld associated with the high point vent valves. The crack was initially 120 degrees of the pipe circumference. A decision was made to raise reactor power to the point where the minimum flow line control valve could be shut, allowing repairs to be performed. At 0016, before reactor power could be raised, the 0.75 inch vent line sheared off. In response to this failure, the reactor mode switch was placed in Shutdown. At 0019, the feedwater pump was removed from service to isolate the leak from the feedwater pump minimum flow line.

There was no impact on Nine Mile Point Unit 1 (NMP1) from this event.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

There were no inoperable components or systems that contributed to this event.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES

(Note: All times are on August 11, 2001 except as noted.)

2200 (August 10, 2011) - Leak identified on feedwater pump minimum flow vent pipe.

0016 Mode switch placed in Shutdown following report of a total failure of the vent line on the running feedwater pump.

0019 Reactor feedwater pump "A" secured to isolate the leak.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

F. METHOD OF DISCOVERY:

The leak on the feedwater pump minimum flow line vent pipe was discovered during a walk down of the plant near the feedwater pump area. The source of the leak was found to be at the heat affected zone of the vent pipe to sock-o-let weld on the vent pipe for the feedwater pump minimum flow line.

G. MAJOR OPERATOR ACTION:

Upon initial notification of the feedwater minimum flow line leak, a decision was made to raise reactor power to the point where the minimum flow line control valve could be shut allowing repairs to be performed. Before

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Nine Mile Point Unit 2	05000410	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 of 5
		2011	003	00	

NARRATIVE

reactor power could be raised, the vent line sheared off. In response to this failure, the reactor mode switch was placed in Shutdown and the feedwater pump was removed from service to isolate the leak from the feedwater pump minimum flow line.

H. SAFETY SYSTEM RESPONSES:

All safety systems responded per design. The plant was shut down by placing the mode switch in Shutdown. There was no loss of offsite power to the onsite emergency buses and the Emergency Core Cooling Systems (ECCS) were available, but were not called upon to support the safe shutdown of the reactor.

II. CAUSE OF THE EVENT:

The cause of the failure falls under NUREG-1022 cause code B (Design, Manufacturing, Construction/Installation). Analysis done on the pipe indicated that the weld cracked due to vibration induced fatigue. The vibration increased due to two recent design modifications that affected the "A" feedwater pump minimum flow line. The potential for these design changes to increase vibration and adversely impact system operation had been identified, but was not anticipated to result in a failure of this type. Although the minimum flow piping had been evaluated and was being monitored, the small bore vent line had not been equally modeled or evaluated. Knowledge based decisions were made using engineering judgment that resulted in a failure to evaluate the potential impact of vibration on the vent pipe.

The crack was located at the sock-o-let weld between the feedwater pump "A" minimum flow line and the associated vent pipe. The crack was outside diameter initiated.

The "A" loop feedwater minimum flow vent line had a prior history of failures. Similar failures have not been experienced on the other two feedwater minimum flow vent lines. The "A" loop failures have included the following:

On June 5, 1988, the point where the high point vent valve taps off of the minimum flow line was cracked 50 percent around the joint. The 0.75 inch pipe was cut off, the old weld was ground out and the pipe was rewelded in place. A visual inspection was done after flow was established verifying no leakage.

On May 05, 1989, a small leak was found where the vent valve was attached to the main pipe. This was unable to be repaired due to plant conditions. Instead a plug cap was installed in the sock-o-let. On September 28 1989, a new sock-o-let was installed, the vent pipe was reinstalled and new valves were installed.

This event was entered into the Nine Mile Point Nuclear Station corrective action program (Condition Reports CR-2011-007319 and CR-2011-007368).

III. ANALYSIS OF THE EVENT:

This event involved "...The actuation of the reactor protection system (RPS) when the reactor is critical." The notification per 10 CFR 50.72(b)(2)(iv)(B) was completed on August 11, 2011, at 0058.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Nine Mile Point Unit 2	05000410	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 of 5
		2011	003	00	

NARRATIVE

This event is reportable in accordance with 10 CFR 50.73 (a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)," which includes the reactor protection system.

On August 10, 2011 at 2200, the vent pipe leak revealed itself when water was found on the floor near the feedwater pumps. After investigating the source of the water, the crack in the vent pipe on the "A" feedwater pump minimum flow line was found. The pipe was cracked 120 degrees around the pipe adjacent to the weld. Since the reactor was at 15% power, a decision was made to increase power until the minimum flow line could be isolated and pumps swapped to repair the leak. Before this could be done, at 0016 (August 11, 2011), the vent pipe sheared off. In response to this failure, the Reactor Protection System (RPS) was manually actuated by placing the mode switch in Shutdown. The leak was isolated by removing the "A" feedwater pump from service.

There were no systems inoperable and no system failures related to this event. There were no safety consequences for this event. The leak was on the minimum flow line of the "A" feedwater pump. Had this occurred at higher power, the minimum flow line could have been isolated. All safety systems were available during this event. It is therefore concluded that even if a design basis accident had occurred concurrent with this event, all safety systems would have operated to safely mitigate the event. Based on the above considerations, the safety significance of this event is very low, and the event did not pose a threat to the health and safety of the public or plant personnel.

This event increases the NRC Regulatory Oversight Process (ROP) Index for Unplanned Scrams per 7000 Critical Hours from 0.0 to 0.81. This is compared to the Green-to-White threshold value of greater than 3. This will not result in entry into the Increased Regulatory (White) Response Band.

IV. CORRECTIVE ACTIONS:

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

1. The vent pipe was rewelded using an unequal leg fillet weld with a 2:1 taper for attaching the vent pipe to the sock-o-let to increase the fatigue strength. In addition, a pipe-to-pipe support has been installed to make the pipe more robust and less susceptible to vibration.
2. PT exams were performed on the "B" and "C" feedwater pump minimum flow lines at similar locations to where the crack occurred. The examinations revealed no indications of degraded conditions on the "B" or "C" pipes.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

The upcoming design change to replace and modify the "A" feedwater minimum flow valve and associated piping will be revised to update the model that is used to study vibrations on the minimum flow lines. The vent lines and cantilevered members on the minimum flow lines will be added to the revised model. The model will also include enhancing the "B" and "C" vent lines with a 2:1 weld and pipe-to-pipe tie back supports.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Nine Mile Point Unit 2	05000410	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 of 5
		2011	003	00	

NARRATIVE

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The pipe on the vent line for the "A" feedwater pump minimum flow line cracked and the vent pipe sheared off.

B. PREVIOUS LERs ON SIMILAR EVENTS:

There are no other LERs at Nine Mile Point relating to leaks on cracked welds.

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EII) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 COMPONENT IDENTIFIER	IEEE 805 SYSTEM IDENTIFICATION	PART NUMBER
Reactor Protection System	N/A	JC	N/A
Feedwater System	N/A	SJ	N/A

D. SPECIAL COMMENTS:

None